

$\mathcal{H}_1 = \{ \mathbf{h}_1, \mathbf{h}_2, \dots, \mathbf{h}_M \}$ and $\mathcal{H}_2 = \{ \mathbf{h}_{M+1}, \mathbf{h}_{M+2}, \dots, \mathbf{h}_{M+N} \}$ are the two sets of hypotheses. The test statistic is defined as $T(\mathbf{y}) = \sum_{i=1}^M \mathbf{y}^T \mathbf{h}_i \mathbf{h}_i^T \mathbf{y}$. The decision rule is to choose \mathcal{H}_1 if $T(\mathbf{y}) \geq \tau$ and \mathcal{H}_2 otherwise. The threshold τ is chosen such that the probability of false alarm is α . The probability of detection is β . The ROC curve is the plot of β versus α . The AUC is the area under the ROC curve. The AUC is a measure of the performance of the classifier. The AUC is 0.5 for a random classifier and 1.0 for a perfect classifier. The AUC is 0.75 for a good classifier. The AUC is 0.85 for a very good classifier. The AUC is 0.95 for an excellent classifier. The AUC is 1.0 for a perfect classifier.

